depends essentially on the rainfall of the wet season combined with the power of the soil to store it away at considerable depths, but to bring it to the surface by capillary action when needed. The normal rainfall of each month is given in the preceding table from which we see that the sum for October, November, and December is 3.25 inches, and for January, February, March, April, and May 5.97 inches, making the total for the wet season 9.22 inches. For the dry season, June-September, the total is 0.31 inches. The actual rainfalls for the successive wet and dry seasons have been as follows, according to Mr. Carpenter's table:

Inches I	Wet season.		Dry season.		
180	October to May.	Rainfall.	June to September.	Rainfall.	
180		Inches.		Inches.	
S80-51	849-50		1850	Ö.	
851-52 9.88 1852 852-53 10.84 1853 853-54 10.99 1854 854-55 12.17 1855 856-57 4.78 1857 856-57 4.78 1857 857-58 7.56 1859 858-59 6.59 1859 860-61 7.76 1861 861-62 15.75 1880 861-63 1853 683 863-64 5.25 1884 863-65 11.38 1865 863-66 11.38 1866 865-66 11.39 1867 867-68 11.41 1868 869-70 5.4 1872 867-71 18.93 1807 867-89 11.22 1869 869-70 5.4 1872 867-71 15.9 1872 872-73 8.18 1873 872-73 8.18 1873 873-74	850-51	8.41		ŏ.	
10.84 1853 1854 1855 19.84 1855 19.85 19.85 19.85 1866 19.85 1856 19.85 1856 1855 1856 1855 1856 1855 1856 1855 1856 1855 1856 1855 1856 1855 1856 1855 1856 1855 1856		9.88	1852	0.	
10.99 1854 10.99 1855 1855 1855 1855 1856 1855 1856 1857 1855 1856 1857 1855 1856 1858 1856 1858 1857 1855 1858		10.84		Ö.	
185-66	353-54			1.	
58-57 4.78 1857 57-88 7.56 1858 59-60 6.59 1859 60-61 7.76 1861 61-62 15.75 1862 63-64 3.76 1863 63-65 9.63 1865 64-65 9.63 1866 66-67 13.93 1897 67-68 11.41 1868 68-69 11.22 1869 69-70 5.54 1870 70-71 5.06 1871 71-72 7.36 1872 72-73 8.18 1873 73-74 15.07 1874 74-75 5.82 1875 76-77 3.66 1877 77-73 8.18 1873 73-74 15.07 1874 74-75 5.82 1875 77-77 3.66 1877 77-78 7.88 1879 79-80 14.77				0.	
57-58 7.56 1858 (5) 58-59 6.59 1859 (6) 59-60 6.70 1860 (6) 60-61 7.76 1861 (7) 61-62 15.75 1862 (6) 62-63 3.76 1863 (6) 63-64 5.25 1864 (6) 64-65 9.63 1865 (7) 65-66 11.63 1866 (6) 66-67 13.93 1867 (6) 67-68 11.44 1868 (6) 69-70 5.54 1870 (7) 70-71 5.06 1871 (7) 71-72 7.36 1872 (7) 72-73 8.18 1873 1 72-73 8.18 1873 1 72-75 5.82 1875 (7) 74-75 5.82 1875 (7) 77-78 16.10 1878 (7) 78-79 7.88 1879 (7) 79-80 14.77				0.	
58-59 6.59 1859 59-60 6.70 1880 60-61 7.76 1861 61-62 15.75 1862 61-62 15.75 1862 63-64 5.25 1864 64-65 9.63 1865 65-66 11.63 1866 67-68 11.44 1868 88-69 11.22 1869 99-70 5.54 1870 70-71 5.06 1871 70-71 5.06 1871 72-73 8.18 1873 32-74 15.07 1874 74-75 5.82 1875 75-76 9.99 1876 76-77 3.66 1877 77-78 16.10 1878 8-79 7.88 1879 98-81 9.99 1876 16-77 1880 1880 18-82 9.50 1882 18-83 4.92	56-57			ō	
59-60 6.70 1880 60-81 7.76 1861 61-62 15.75 1862 62-83 3.76 1863 63-64 5.25 1864 64-85 9.63 1865 5-86 11.33 1865 66-67 13.93 1867 67-68 11.44 1868 68-90 11.22 1860 69-70 5.54 1870 70-71 5.06 1871 71-72 7.36 1872 72-73 8.18 1873 37-4 15.07 1874 67-75 5.82 1875 72-73 8.18 1873 37-74 15.07 1874 67-77 3.66 1877 77-78 3.67 1874 67-77 3.67 1874 67-77 3.68 1877 77-78 3.69 1877 77-78 3.69				0.	
60-61	58-59	6.59		0.	
61 - 62 15.75 1862 62 - 68 3.76 1863 63 - 64 5.25 1864 64 - 65 9.63 1865 5 66 11.63 1866 66 - 67 13.93 1867 67 - 68 11.44 1888 68 - 69 11.22 1869 69 - 70 5.54 1870 70 - 71 5.06 1871 71 - 72 7.36 1872 72 - 73 8.18 1873 73 - 74 15.07 1874 74 - 75 5.82 1875 75 - 76 9.99 1876 76 - 77 3.66 1877 77 - 78 16.10 1878 78 - 79 7.88 1879 99-80 14.77 1880 0.81 19.26 1881 11-82 9.50 1882 18-82 9.50 1882 18-83 4.92 1883 1	59-60	6.70		0	
82-88 3.76 1863 (9.84)	60-61			1.	
18-64 5.25 1864 63-65 9.63 1865 1655 1666 11.63 1866 1667 13.93 1867 167-68 11.44 1868 1869 11.22 1869 1869 1869 1871 1872 1873 1874 1874 1875 1874 1875 1874 1875 1875 1875 1875 1875 1876 1877 1876 1877 1876 1877 1876 1877 1876 1877 1876 1877 1876 1877 1876 1877 1876 1877	01-02			0.	
				0.	
55-66 11.63 1866 (6) 67-68 11.44 1868 (6) 98-69 11.22 1869 (7) 99-70 5.54 1870 (7) 70-71 5.06 1871 (7) 70-71 5.06 1871 (7) 72-73 8.18 1873 1873 32-74 15.07 1874 (7) 74-75 5.82 1875 (7) 75-76 9.99 1876 (7) 76-77 3.66 1877 (7) 76-78 16.10 1878 (7) 8-79 7.88 1879 (7) 98-80 14.77 1880 (7) 98-81 9.26 1881 (8) 31-82 9.50 1882 (8) 32-83 4.92 1883 (8) 34-84 25.97 1884 (8) 34-85 8.80 1885 (8) 38-89 11.05 1889 (9) 39-90 14.98<				0. 1.	
13-97 13-93 1807 1807 1808 1808 1808 1808 1808 1808 1809				0	
67-88 11.44 1868 68 69-89 11.22 1869 69-70 5.54 1870 69-70 65-84 1870 69-70 65-84 1870 69-70 69-70 1872 69-70 69-70 1871 69-70 1872 69-70 69-70 1872 69-70 1872 69-70 1874 69-70 69-70 1874 69-70 1874 69-70 69-70 1875 69-70 69-70 1875 69-70 69-70 69-70 1875 69-70 69-70 79-70 <t< td=""><td></td><td></td><td></td><td>ő</td></t<>				ő	
18-89	87-8Q			ő	
19-70	88.60			ő	
70-71				Ŏ	
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				iŏ	
15.07 1574 17.07 1574 17.07 1574 17.07 1574 17.07				ĭ	
74-75 5.82 1875 (75-76) (9.99) 1876 (76-77) 3.66 1877 (77-78) (77-78) 1878 (77-78) (78-79) (78-8) 1879 (78-79) <t< td=""><td>73-74</td><td>15.07</td><td>1874</td><td>Ö.</td></t<>	73-74	15.07	1874	Ö.	
Terr		5.82	1875	0.	
				0.	
				0.	
19-80				0	
30-81 9.26 1881 61-82 9.50 1882 61-82 9.50 1882 61-82 9.50 1882 61-82 9.50 1882 61-82 9.50 1883 61-82 9.50 1884 61-82 9.50 1885 61-82 9.50 1885 61-82 9.50 9.50 9.50 1888 61-82 9.50 9.5				0	
31-92 9.50 1892 32-83 4.92 1883 33-84 25.97 1884 (3.85) 34-85 8.80 1885 (3.86) 36-87 8.33 1886 (6.87) 38-89 11.05 1889 (8.89) 1888 38-89 11.05 1889 (8.90) (9.90)				Q.	
				0	
34-95 8.80 1885 35-86 16.83 1886 36-87 8.33 1887 37-88 9.82 1888 39-90 14.98 1890 30-91 10.47 1891 19-92 8.65 1892 32-93 9.21 1893 33-94 5.01 1894 65-96 6.94 1896 65-96 6.94 1896 65-97 11.66 1897 77-98 4.98 1898					
1896 16.88 1896 1896 1896 1896 1896 1896 1896 1897 1898 1898 1898 1899 1898 1899 1899 1899 1899 1899 1899 1899 1899 1898 1899				. ŏ	
36-67 8.83 1887 37-88 9.82 1888 38-89 11.05 1889 39-90 14.98 1890 0.91 10.47 1891 10-92 8.65 1892 22-93 9.21 1893 33-94 5.01 1884 4-95 11.86 1895 45-96 6.34 1896 66-97 11.66 1897 7-98 4.98 1898 6				. 0	
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38-89 11.05 1889 6 39-90 14.98 1890 6 30-91 10.47 1891 6 30-92 8.65 1892 6 22-93 9.21 1893 6 33-94 5.01 1894 6 4-95 11.86 1895 6 36-97 11.66 1897 6 77-98 4.98 1898 6				Ŏ.	
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93-94 5.01 1894				0	
94-95 11.86 1895 (6.84) 1896 (7.98)				0.	
75-96 6 6.94 1896 (7.00-97) 11.66 1897 (7.98 4.98 1898 (7.00-97)				0.	
96-97				0.	
77-98				0.	
				0.	
3-31 1899				0.	
	98-99	5.31	1099	0.	
Average 9.61 Average	Avaraga	9,61	Average	0.	

This important table shows that there have been eighteen wet seasons in which rain has been abundant and five seasons in which the rainfall has been less than 5 inches, and therefore decidedly insufficient. The smallest amounts were 3.66 inches for the season of 1876–77, and 3.76 inches for that of 1862–63. The number of times that any given rainfall occurred is as follows:

Wet season.		Dry season.					
Rainfall.	No. of cases.	Rainfall.	No. of cases.				
3.00- 4.99 5.00- 6.99 7.00- 8.99 9.00-10.99 11.00-12.99	5 9 9 11 7	0.00-0.49. 0.50-0.99. 1.00-1.50. 1.50-2.00.	5 1 3				
15.00–16.99	49	Total					

This table shows that there is a fair prospect of having 15 or 16 inches of rainfall during the wet season four times in fifty years, or once every thirteen years, but that rainfalls above that are much less likely. On the other hand, rainfalls of 3 and 4 inches occur on the average once in every ten years, and rainfalls less than that are about as likely to occur as the great rainfalls above 17 inches. There is no evidence of any periodicity except a slight tendency for the large and small rainfalls, respectively, to occur in groups. Eight of the larger rainfalls have occurred in isolated seasons, and ten of them in groups of three and four each. The small rainfalls have also occurred in groups of about three years.

There is nothing to show how local or general were the rains recorded by the San Diego gage, therefore any deductions from its records may not be strictly applicable to the surrounding district. It would, however, seem that there is very little likelihood that the rainfall for the season 1899–1900 will be smaller than 4 inches, so that the three seasons just past will represent nothing worse than has happened twice before within fifty years, namely, between 1855 and 1860 and between 1869 and 1872. It is now very easy for the planter to estimate how many bad seasons he will have in fifty years and what proportion of capital must be devoted to the storage of water in order to make agriculture profitable on the average of any given number of consecutive years at San Diego.

WIND-ROSES FOR OKLAHOMA.

In the January report of the Oklahoma section Mr. C. M. Strong publishes an extremely interesting bit of climatological work, namely, a so-called wind-rose for the prediction of rainfall. The ordinary wind-rose gives the total number of times of occurrence or the total amount of any meteorological phenomenon, in connection with the wind prevailing at that moment, and shows, for instance, that the northwest wind is cold, or that rainfall occurs with a southeast wind. But Mr. Strong's table shows what will follow a given wind within twelve hours, and that, too, for each month of the year. Apparently it is compiled by counting the number of times that rain fell as recorded at either 8 a. m. or 8 p. m., and accrediting this rain to the wind recorded at the preceding observation. It is based on the nine years 1891-99, inclusive, and we copy it as follows:

Table 1.—Showing the number of times precipitation followed the respective winds within tooke hours.

Direction.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average per cent.
North Northeast East Southeast South Southwest West Northwest	22 10 3 20 20 5 0 3	21 10 2 17 12 0 0 3	14 12 10 23 19 7 0 2	13 7 5 35 27 0 0 8	8 15 11 38 30 7 1 2	5 11 7 34 29 5 0 3	5 19 6 28 20 4 2 3	5 7 22 21 5 1 4	9 11 5 13 14 2 0 2	12 4 4 21 19 2 0	13 6 3 22 15 2 0 2	17 16 7 9 24 6 0 3	15 13 7 29 26 5 1

Table 2.—Showing total number of times each wind direction was observed for each year from 1891 to 1899, inclusive.

Year.	N.	NE.	E.	SE.	s.	sw.	w.	NW.	Calm.
1891	126	75	87	208	154	47 53	12 18	50 59	21
1892 1893	128 116	73 68	39 24 21	195 180	148 158 197	82 102	18	67	19 17 16
1894	119 152	75 57	16	131 138 162	199	81 75	22 18	47 65	16. 9
1896	127 126	68 69	19 32 58	110 110 93	210 231 243	83 48	15 20 28	50 57 68	2
1898	134 128	55 66	68	80	270	46	17	52	3
Average per cent	18	9	5	20	28	9	2	8	1